Brief Clinical Report

Laparoscopic Management of a Noncommunicating Uterine Horn in a Patient with an Acute Abdomen

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Summary: A 13-year-old girl with a history of cloacal anomalies presented with acute abdominal pain. Abdominal ultrasound was not definitive, and vaginal probe ultrasound was precluded by the patient’s stenotic vagina. Magnetic resonance imaging delineated a left hematometra and hematosalpinx as well as a more normal-appearing right hemiuterus. Operative laparoscopy was used to lyse the extensive pelvic adhesions in a patient with a history of an imperforate anus and to resect a left rudimentary uterine horn with outflow obstruction. A review of cases in the world literature reveals that operative laparoscopy can be used to treat these patients successfully. Key Words: Rudimentary uterine horn—Acute abdomen—Magnetic resonance image.

Failure of lateral fusion of the Mullerian ducts during the 8th week of intruterine development may result in two separate uterine bodies (1). Association of this with maldevelopment of one Mullerian duct results in a unicornuate uterus or a unicornuate uterus with a small rudimentary horn attached. In one series, 11 of 13 patients with a unicornuate uterus had a rudimentary horn (2). Although an isolated unicornuate uterus is usually asymptomatic, reproduction is compromised by increased infertility, fetal wastage, and preterm labor (3). Association of a unicornuate uterus with a rudimentary horn, however, may result in surgical emergencies. A rudimentary horn pregnancy will usually develop with the signs and symptoms of an ectopic pregnancy. O’Leary and O’Leary reviewed a total of 327 cases of rudimentary horn pregnancy reported since Mauriceau’s case in 1669 and estimated that there is no communication between the rudimentary horn and its more normal companion in about 90% of cases (4). Outflow obstruction can lead to presentation with an acute abdomen in the absence of pregnancy. When a rudimentary horn contains functional endometrium and does not communicate externally, severe dysmenorrhea will begin soon after menarche (2).

This report describes the laparoscopic treatment of a unicornuate uterus with noncommunicating rudimentary horn, a configuration categorized as class IIB by the American Fertility Society (AFS) classifications of Mullerian anomalies (5). The previously reported five cases of laparoscopic treatment of Mullerian remnants, including four class IIB anomalies, are reviewed. The case reported here is unique for the use of magnetic resonance imaging (MRI) in the diagnosis, the treatment of a pediatric patient, and the patient’s associated developmental anomalies.

CASE REPORT

A 13-year-old girl, gravida 0, arrived at the emergency department 5 days after onset of her menses complaining of 5 days of severe backache and abdominal pain. A product of a normal term pregnancy remarkable for the presence of a single um-
bilical artery, she had a history of an imperforate
vaginal septum. An intravenous pyelogram revealed
normal ureters; however, the urethral meatus was
located high in the vagina. Menarche began 9
months before presentation, and the patient was in
her third episode of menses on arrival at the emer-
gency department. She was not sexually active and
had no prior pelvic speculum exam. Serum beta hu-
mant chorionic gonadotropin was negative. An ab-
dominal ultrasound revealed an enlarged, poorly
defined endometrial stripe. Bilaterally, serpiginous
adnexal structures were noted, suggesting dilated
fallopian tubes. Given the caliber of the patient's
vagina, a vaginal probe ultrasound was not possible
and an MRI was obtained, which suggested the ex-
istence of a small right-sided uterus and a larger
left-sided dilated pelvic mass containing blood. Ini-
tial management consisted of pain control while ex-
amination under anesthesia and definitive surgery
were planned.

Under general endotracheal anesthesia, the pa-
tient underwent operative videolaparoscopy. Ex-
amination under anesthesia revealed a stenotic vag-
nal canal. Bimanual examination revealed a firm
8-cm-diameter left pelvic mass associated with the
vaginal apex. Vaginoscopy using a 5-mm laparo-
scope demonstrated a normal-appearing cervix on
the right side of the vaginal apex. No cervical open-
ing was seen on the left side. A small longitudinal
septum measuring 2 mm was noted at the vaginal
apex. Laparoscopy revealed extensive adhesions of
the sigmoid colon to a left hematosalpinx and to a 10
× 6 × 6-cm dumbbell-shaped hematometra repre-
senting the left noncommunicating rudimentary
uterine horn. Extensive adhesions of the cecum and
vermiform appendix to the right adnexal area were
also noted, as was a tortuous dilated right fallopian
tube. After lysis of adhesions, a right-sided 5 × 2 ×
1 cm hemiuterus was uncovered in close association
with the peritoneum of the right pelvic side wall and
was shown via manual examination to be contigu-
ous with the cervix. Bilaterally, the ovaries were
involved in adhesions but were otherwise normal
with a functional cyst on the right.

Using CO₂ laser and hydrodissection, meticulous
adhesiolysis was used to define further the marked-
edly abnormal pelvic anatomy. The left infundibu-
lar ligament was identified. The left mesosal-
pinx and isthmic portion of the left fallopian tube
were then serially coagulated using bipolar electro-
cautery and incised, allowing removal of the tube.
The left hemiuterus was then incised and drained.
The left round ligament was then coagulated and
transected, facilitating development of a bladder
flap by both sharp and blunt dissection, followed by
coagulation and cutting of the left utero-ovarian lig-
ament, broad ligament, and uterine artery. Given
the extensive adhesions of the rectum to the lower
uterine segment of the left hemiuterus, the decision
was made to excise the hemiuterus at the level of
the lower uterine segment. Exploration of this cav-
ity revealed no communication to the vagina. Fol-
lowing ablation of the epithelium lining the cavity
using bipolar coagulation, the cuff of the lower uter-
ine segment was closed with interrupted 4-0 poly-

glactin (Vicryl) sutures. The specimen was cut in
several parts and removed from the abdomen
through the infraumbilical incision. Finally, sig-
moidoscopy with pneumo-inflation was performed,
confirming an intact rectum and sigmoid colon.

Pathology reports confirmed the presumed diag-
nosis of mullerian dysgenesis with both tubal and
endometrial tissues identified. Postoperatively the
patient contracted an enterococcal urinary tract in-
fecion and was treated with ampicillin. She went
home 3 days after surgery and began a regimen of
intramuscular Depo-Provera (150 mg every 3
months). She continues to be free of pelvic pain 4
months after surgery.

DISCUSSION

The management of this case illustrates various
techniques that are useful for the treatment of
symptomatic mullerian dysgenesis. The utility of
MRI in the evaluation of suspected mullerian anom-
alies is well documented (6). In this patient, in
whom abdominal ultrasound was nondiagnostic and
vaginal probe ultrasound was precluded by a ste-
notic vagina, preoperative MRI defined a small
right-sided hemiuterus and an enlarged left he-
matometra (Fig. 1).

Operative laparoscopy is rapidly becoming the
state-of-the-art treatment of symptomatic noncom-
municating rudimentary uterine horns. A review of
the world literature reveals five reports of laparo-
sscopic removal of mullerian remnants between 1990
and 1995 (7–11). Four of these cases involved uni-
lateral removal of a rudimentary horn, and one case

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involved removal of bilateral remnants in a patient without a vagina. Table 1 summarizes the cases.

Patient ages ranged from 13 to 30 years. The case we report is remarkable for the diagnosis and treatment of a patient at age 13 years; in the other reported cases of AFS class IIB anomalies the mean age is more than 28 years. Although severe dysmenorrhea begins soon after menarche, cyclic menstruation from the communicating hemiuterus occurs and cryptomenorrhea may not be considered, thus delaying the diagnosis. With a patent fallopian tube connected to the rudimentary uterus, retrograde menstruation may lead rapidly to pelvic endometriosis (2). Thus, diagnosis and treatment as soon as possible are important to avoid compromising fertility. Four of the six cases reviewed in Table 1 reported either endometriosis or severe adhesions at laparoscopy. Of the two remaining cases, one was pretreated with a gonadotropin releasing hormone agonist for 6 months, and the other involved removing bilateral remnants without evidence of endometrial tissue on pathologic evaluation.

The case we report is also notable for the patient’s other developmental anomalies: single umbilical artery and imperforate anus. The association of congenital anomalies in infants with one umbilical artery and imperforate anus is rare and has been previously reported (1, 3). Here we report a new case with an unusual combination of findings.

![Image](image)

**FIG. 1.** Magnetic resonance images of the pelvis identify an obstructed left rudimentary horn (RH) and a smaller, thin right hemiuterus (arrows). Bladder (B) and fallopian tube (FT) are also shown.

**TABLE 1.** Reported cases of laparoscopic removal of mullerian remnants (1990–1995)

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Age (yrs)</th>
<th>Symptoms</th>
<th>Preop Rx</th>
<th>IVP</th>
<th>Endometriosis</th>
<th>Anomaly</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canis (7)</td>
<td>1990</td>
<td>30</td>
<td>Dysmen, Dyspar</td>
<td>GnRH agonist (3 mo)</td>
<td>Normal</td>
<td>Present</td>
<td>AFS class IIB</td>
<td>Horn removed via 2-cm incision</td>
</tr>
<tr>
<td>Yeko (8)</td>
<td>1992</td>
<td>18</td>
<td>Dysmen</td>
<td>None</td>
<td>Normal</td>
<td>Not present</td>
<td>Absent vagina, bilateral mullerian remnants</td>
<td>No uterine arteries present, no endometrium identified</td>
</tr>
<tr>
<td>Nezhat (9)</td>
<td>1994</td>
<td>28</td>
<td>Dysmen</td>
<td>Danazol (6 mo)</td>
<td>Bilateral sponge kidneys</td>
<td>Present</td>
<td>AFS class IIB</td>
<td>Hysterectomy aided diagnosis</td>
</tr>
<tr>
<td>Mais (10)</td>
<td>1994</td>
<td>26</td>
<td>Dysmen, pelvic pain</td>
<td>GnRH agonist (6 mo)</td>
<td>Normal</td>
<td>Not present</td>
<td>AFS class IIB</td>
<td>Endoscopic stapler used</td>
</tr>
<tr>
<td>Schattman (11)</td>
<td>1995</td>
<td>29</td>
<td>Dysmen, infertility</td>
<td>None</td>
<td>Normal</td>
<td>Present</td>
<td>AFS class IIB</td>
<td>Standard technique</td>
</tr>
<tr>
<td>Present case</td>
<td>1995</td>
<td>13</td>
<td>Dysmen</td>
<td>None</td>
<td>Vaginal urethra</td>
<td>Not present, extensive adhesions noted</td>
<td>AFS class IIB, associated imperforate anus</td>
<td>MRI and vaginoscopy aided diagnosis</td>
</tr>
</tbody>
</table>

Rx, treatment; IVP, intravenous pyelogram; AFS, American Fertility Society; GnRH, gonadotropin releasing hormone; MRI, magnetic resonance imaging; dysmen, dysmenorrhea; dyspar, dyspareunia.
tical artery missing is well characterized and estimated at 30% (12). Most anorectal malformations result from abnormal development of the urorectal septum, resulting in incomplete separation of the cloaca. Imperforate anus results from failure of the anal membrane to perforate at the end of the 8th week of development (1). Although mullerian dysgenesis is not commonly associated with anorectal anomalies, both anomalies result from maldevelopment during the 8th week.

Ultrasound was used to image the pelvis in all cases. Only in the case reported herein was MRI used. Although all patients had intravenous pyelograms demonstrating normal ureters, the association of urinary tract anomalies with mullerian dysgenesis is well known (2,12). Bilateral mild medullary sponge kidneys were reported in one case (9), whereas in the case described here, a high vaginal urethral meatus was noted. Preoperative imaging of the ureters allows safer resection.

The surgical technique is similar to a completely laparoscopic hysterectomy. Variations in surgical technique included removal of the horn through a small suprapubic incision (7), concurrent use of hysteroscopy (9), and use of an endoscopic stapler (10). All surgeries were effective in relieving severe dysmenorrhea. No major complications were reported.

Regardless of the therapeutic surgical approach, diagnostic laparoscopy is useful in verifying the diagnosis in cases of mullerian dysgenesis. The advantages of laparoscopic resection over laparotomy include reduced postoperative adhesion formation, hospital stay, postoperative pain, and recovery time. The case reported here and the previously successful applications of minimally invasive surgical techniques demonstrate that with appropriately trained surgeons these techniques are becoming the standard treatment of symptomatic noncommunicating rudimentary uterine horns.

REFERENCES